

Children and Mental Health of Elderly

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Abstract

Only very few studies document a positive effect of social support on mental health. However, the contact with one's children might be of a different quality as compared to that with friends or neighbours. Based on the international comparative data of the *Survey of Health, Ageing and Retirement in Europe* (SHARE), we analysed how the number of children, their proximity and the frequency of contact between elderly parents and their children affect the mental health of the elderly. In view of decreasing fertility rates in Europe, this determinant of mental health is of special importance, as we might expect mental health to deteriorate if it is true that the existence of and contact with children has a positive effect on the mental health of their parents. Our results indicate a protective function of children. On the one hand, childless people had higher levels of depression; on the other hand, few contacts with children also had a negative effect on the mental health of elderly parents. Moreover, family status had a strong protective effect on mental health: elderly people who lived with a spouse or a partner had the lowest levels of depression. When limiting the analysis to persons without a partner, divorce seemed to have a stronger effect on depressions as compared to widowhood. Furthermore, the presence of a spouse or partner had a much stronger protective effect on the mental health of elderly than the presence of or the contact with children. Among the ten countries participating in SHARE, Spain, Italy and France had high levels of depression whereas the elderly in Denmark seemed to be least depressed.

European Demographic Research Papers are working papers that deal with all-European issues or with issues that are important to a large number of countries. All contributions have received only limited review.

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1 INTRODUCTION

“There is no health without mental health” (EC 2005, p. 4). The relevance of mental health as an indivisible part of health is widely accepted. Mental illness can drastically reduce the quality of life of those affected and their families. Good mental health is important for both individuals and society at large. At the individual level, it enables people to realise their intellectual and emotional potential and to find their roles in social and working life. At the level of society, good mental health is important for social and economic welfare.

The most important forms of mental disorders are depression, specific phobias, somatoform disorders and alcohol dependence (Wittchen and Jacobi 2005). Mental disorders are common, estimates for the adult EU population who suffered from some form of mental problems and/or disorders during the past 12 months range from 20 percent to 27 percent (EC 2004b, Wittchen and Jacobi 2005). There is an increasing interest in the mental health of the EU population, and a strong political commitment for action in this field. In October 2005, the European Commission adopted a Green paper that aims at launching a public consultation on how to tackle mental illness and promote mental wellbeing in the EU in a better way (EC 2005). “Problems relating to mental health are a public health priority: the social and economic costs of depression, for example, are of huge importance since depression will be, in a few years, the disease group with the second heaviest toll globally” (EC 2004a, p. 8). In later life, depressive illness and dementia are the two most important mental illnesses (Copeland et al. 1999b).

Based on the international comparative data of the *Survey of Health, Ageing and Retirement in Europe* (SHARE), we analysed symptoms of depression among the elderly in Europe with a special focus on the relationship with their children. In particular, we were interested in how the number of children, their proximity and the frequency of contact with them affected the mental health of elderly. The few studies dealing with social

support and mental health found a positive effect of social support on mental health (e.g. Julian et al. 1992; Dalgard et al. 1995; McCabe et al. 1996; Lehtinen 2005). However, the contact with children might be of a different quality as compared to that with friends or neighbours. In view of the decreasing fertility rates in Europe, this determinant of mental health is of special importance. A positive relation between the contact with children and mental health could imply a higher prevalence of depression among elderly as the number of children decreases.

The lack of comparable data for assessing differences in mental health between different communities across Europe has been pointed out on several occasions (e.g., Copeland et al. 1999a; EC 2004a). SHARE fills the gap and permits us to analyse the health of the elderly population in Europe. Since it not only includes information on health but also on economic circumstances, well-being, integration into the family and social networks, mental health conditions can be analysed in a multi-dimensional context.

2 MEASUREMENT OF MENTAL HEALTH

Mental health has two dimensions, namely positive mental health (well-being) and negative mental health, which includes psychological distress and psychiatric disorders. The positive dimension refers to the concepts of well-being and ability to cope in the face of adversity. The negative dimension relates to the presence of symptoms. Positive and negative mental health cover different aspects. Several studies have shown that results for positive and negative mental health might be inverse (high positive mental health and low negative mental health) or even reverse (both high levels of positive and negative mental health) (EC 2004a).

There are several measures for analysing mental health. The ones most commonly used are the Vitality Index (VT) and the Mental Health Index MHI-5 of the so-called short-form health survey SF-36 developed in the US (Ware et al. 1993; Ware et al. 1994). Other standard instruments are

the GHQ (General Health Questionnaire) and the CIDI (Composite International Diagnostic Interview). A rather young measure for mental health is the EURO-D scale developed by a European consortium (Prince et al. 1999a). It identifies existing depressions and consists of 12 items, with high scores indicating a high level of depression. For more details see Section 4.

Some instruments measure factors of a more generic type such as psychological distress by recording the presence or absence of some symptoms, e.g., anxiety or depression. This type of instrument produces a mental health score. Some of them contain cut-off points by which we can categorise people by allocating them to such groups as ‘probable cases’ suffering from mental health disorders. Instruments in this category include the MHI-5, GHQ or EURO-D. Other instruments such as the CIDI are designed to produce answers that correspond to diagnoses of mental disorders (e.g., mood, anxiety and drug and alcohol disorders) and generate estimates of the prevalence of particular disorders.

At the European level, three surveys also include mental health questions: the Eurobarometer Survey carried out in the Member States of the European Union in 2002, the ESEMeD/MHEDEA 2000 Project comprising six European countries, and the ODIN-survey, which covers five European centres.

Eurobarometer 58.2 covered the population of the ‘old’ EU Member States aged 15 and above. In total, a population of 16,230 people from 15 countries and 2 regions (East Germany and Northern Ireland) were interviewed face to face in autumn 2002. Among other topics, the survey included questions focusing on current symptoms of mental distress, positive mental health (experience of energy and vitality), availability of social support, and use of health services in connection with mental health problems (EORG 2003). The response rates were lowest in Great Britain (23 percent) and highest in France (84 percent) (EORG 2003). The included mental health measures capture negative (MHI-5) and positive mental health (Energy/Vitality Index EVI).

The ESEMeD/MHEDEA 2000 Project (European Study of Epidemiology of Mental Disorders/Mental Health Disability) was a cross-sectional, face to face household interview with probability samples representative of the adult population of six European countries (Belgium, France, Germany, Italy, The Netherlands and Spain). The target population were individuals aged 18 years or older and the sample included more than 21,400 individuals (Alonso et al. 2004a). ESEMeD used the CIDI interview tool to diagnose current or previous mental disorders as well as the SF-12 scale to assess psychological distress. The overall crude response rate for this study was 61.2 percent and, within the countries, the weighted response rate ranged from 45.9 percent in France to 78.6 percent in Spain (Alonso et al. 2004b).

Five centres in Great Britain (Liverpool), Ireland (Dublin), Norway (Oslo), Finland (Turku) and Spain (Santander) participated in ODIN (Outcomes of Depression International Network). On the one hand, ODIN aimed at providing data on the prevalence and risk factors of depressive disorders with a special focus on rural and urban settings; on the other hand it assessed the impact of two psychological interventions on the outcome of depression (Dowrick et al. 1998; Ayuso-Mateos et al. 2001). The sampling frame was adults aged 18 to 64. The study was designed to comprise two phases. Potential cases of depressive disorder were identified in Phase 1. In Phase 2, respondents identified as cases suffering from depressive disorder and a random 5 percent of all respondents were interviewed six and 12 months after the initial interview to assess the impact of two different psychological interventions, namely individual problem-solving treatment and a group education programme.

Some international studies analyse mental health in Europe. The most comprehensive one is the EU report *The State of Mental Health in the European Union* (EC 2004a). It is a 'survey of surveys' and includes an analysis of Eurobarometer and ESEMeD data as well as results from national surveys and macro data. This report describes and compares the state of mental health in the different EU Member States. Surveys done at the

national, regional and local levels were identified by national experts. In this way, information on some 200 surveys was collected. However, many of them were local and inappropriate for generalisation. Meta-analyses based on one of three standard instruments—i.e., GHQ, CIDI and SF-36—could only be carried out for 19 studies.

Further international studies on mental health were done by the EURODEP Consortium, a large international group that aggregated data from surveys involving 21,724 subjects aged 65 years or over from 14 centres in 11 countries (Belgium, Finland, France, Germany, Great Britain, Iceland, Ireland, Italy, The Netherlands, Sweden and Spain). The objectives of the Consortium were (1) to study the variation in the prevalence of depression among elderly in Europe, (2) to compare the clinical features and the mode of depression, and (3) to study risk factors (Copeland 1999). Secondary analyses of epidemiological data and re-analyses of previous studies use the EURO-D scale developed by the Consortium to harmonise the different measures of depression (e.g., Blazer 1999; Prince et al. 1999b; Copeland 1999).

3 DETERMINANTS OF MENTAL HEALTH

Research on mental health is very extensive. There is even an online open access journal in the field of clinical and epidemiological research on mental health, namely *Clinical Practice and Epidemiology in Mental Health* (www.cpementalhealth.com). Literature on mental health focuses, *inter alia*, on clinical aspects and treatments (e.g., Drake et al. 2001; Amber et al. 2006), the social and economic costs of mental health (e.g. Hamilton et al. 1997; Stephens and Joubert 2001; Whooley et al. 2002), health care services and their use (e.g., Alonso et al. 2004d; Harris et al. 2006), and the interrelation between mental and physical health (e.g., Braam et al. 2005; Opolski and Wilson 2005).

Regardless of a person's nationality, his/her mental condition is determined by multiple factors, including biological (e.g., genetics, sex), individual (e.g., personal experiences), familial and social (e.g., social support), economic and environmental (e.g., social status and living arrangements) conditions (Lahtinen et al. 1999). The major pertinent mental health variables are gender, age, marital status, economic situation and employment, residency and immigration status.

In general, poorer mental health is typically found among women (Lehtinen et al. 2005; Carta et al. 2005; Prince et al. 1999b; Alonso et al. 2004c). Copeland et al. (1999a) assessed the prevalence of depression among individuals aged 65 and over in nine European centres and found that women also outnumber men among the elderly. Their meta-analysis shows an overall prevalence of diagnostic depression of 12.3 percent (14.1 percent for women, and 8.6 percent for men). The effect of gender is explained "in terms of methodology (women being more apt to report symptoms), psychopathology (women being more vulnerable and more exposed to aetiological factors) and socialisation (women's conflicting and unrewarding roles in society)" (Weissman and Klerman 1977, cited by Beekman et al. 1999, p. 309).

The results regarding the effect of age are diverse. Based on data collected by the EURODEP Consortium, analyses of depression in late life (i.e., of individuals aged 65 and over) reveal a modest effect of age (Prince et al. 1999b) or find no overall tendency of depression to rise with age, except among the oldest old (Copeland 1999b). Lehtinen et al. (2005) analysed positive mental health among individuals aged 15 and over based on Eurobarometer data and found lower levels of positive mental health among older age groups in most countries, except Sweden, Luxembourg and The Netherlands.

Marital status is an important determinant of mental health: widowed and divorced persons have poorer mental health (Lehtinen et al. 2003; Carta et al. 2005). Mental disorders are more common among persons who were either never married or previously married and currently have no

partner (Alonso et al. 2004c). Having a confidential relationship seems to have a protective effect.

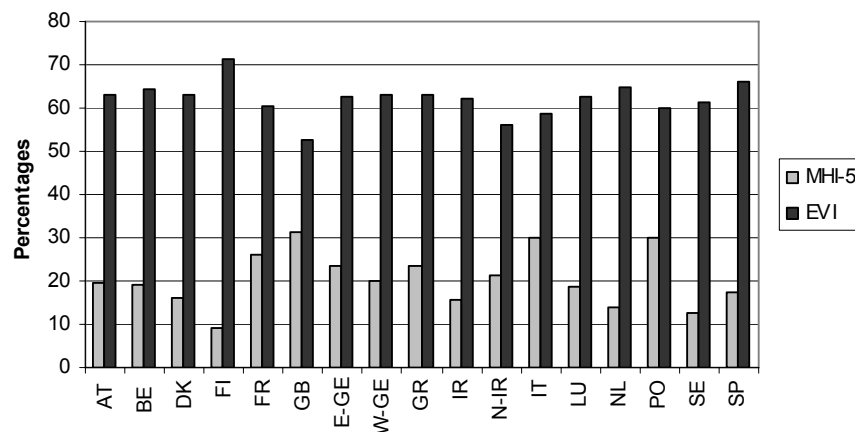
Several studies found links between the prevalence of mental disorders and socio-economic disadvantages. In general, relatively high frequencies of mental disorders are associated with poor education, material disadvantage, low family income, unemployment and pension (Beekman et al. 1999; Alonso et al. 2004c; Fryers et al. 2005; Lehtinen et al. 2005; Carta et al. 2005). Consistent with analyses on European data, Kessler et al. (1994) found elevated rates of affective and anxiety disorders among women and individuals with lower socio-economic status for the US. Other studies showed a statistically significant relation between residency and mental health, with the lowest values being registered in large cities (Ayuso-Mateos et al. 2001; Lehtinen et al. 2003; Lehtinen et al. 2005).

International comparisons reveal striking differences in depressive symptoms among countries. Copeland et al. (1999a) identified London, Berlin and Verona as high scorers, and Iceland, Liverpool, Zaragoza, Dublin and Amsterdam as low scorers. Analyses based on Eurobarometer data showed lowest scores for mental health problems in Finland, Sweden and The Netherlands. Psychological distress was measured using MHI-5. The highest scores, along with remarkable gender differences in terms of higher female to male ratios, were found in Great Britain, Italy and Portugal. Moreover, rather high rates were found in France and Greece (EORG 2003). Spain, Germany, Belgium, Denmark, Austria, Luxembourg and Ireland were in the middle range (EORG 2003).

Besides the aspect of negative mental health, the Eurobarometer 2002 also included EVI as a measure for positive mental health. Finland, Spain, Belgium and The Netherlands had the highest scores for positive mental health, whereas Great Britain, Northern Ireland, Italy, Portugal, France and Sweden had the lowest levels of positive mental health (EORG 2003; EC 2004a). As mentioned earlier, positive and negative mental health are different aspects of one and the same thing, and the results might be reverse or even inverse. Positive mental health scores do not correspond to

the inverse of negative mental health (Figure 1). Some countries such as Finland, Sweden and The Netherlands have strictly inverse results, i.e., high values for positive mental health and low values for negative mental health. The reverse situation can be found in Italy, Portugal and France, which have high levels of positive mental health and high levels of psychological distress (EORG 2003).

Figure 1 Indexes of positive mental health (EVI) and negative mental health (MHI-5) according to Eurobarometer 2002.



Legend: Occurrence of MHI-5 cases (Score 52 or less) and means of EVI scale (SF-36)

Source: EORG (2003)

The six-country ESEMeD study included an assessment of lifetime disorders and the current prevalence of mood disorder (including depression) and major depressive episodes. According to this study, Italy is the country with the lowest level of mood disorder. Compared to Italy, people in Belgium, France and The Netherlands run a significantly higher risk of suffering from a mood disorder. The level of mood disorder in Spain and Germany is comparable to that of Italy (EC 2004a). Comparing the results based on Eurobarometer 2002 data and on ESEMeD shows that the results

for Italy are contradictory: according to ESEMeD, Italy has the lowest level of mood disorders, while—as mentioned earlier—it has the highest rates of mental health problems according to Eurobarometer data.

A few studies focus on the relationship between social support and mental health. Lehtinen et al. (2005) analysed positive mental health in 11 EU countries or regions based on Eurobarometer data, and found poorer mental health among the group with weak social support. For measuring social support, they used the 3-item Oslo social support scale based on three questions that ask for (1) the reported number of close friends, (2) perceived concern and (3) practical help from others if needed. Hence, in the Eurobarometer 2002, the focus was rather on potential support. Lehtinen et al. (2005) analysed support by others and did not distinguish between partners, children, relatives, friends or neighbours.

In a survey of Oslo, Dalgard et al. (1995) found that social support protects against the development of mental disorder when the individual is exposed to such stressors as negative life events. This so-called buffering effect is especially strong for depression. According to McCabe et al. (1996), people who reported they had no close friend or relative with whom they could talk about personal or emotional problems also reported significantly poorer mental health. Julian et al. (1992) analysed the psychological well-being of professional men at midlife. Despite the small sample size (only 75 men) and the younger age group, the study is interesting, because it reveals that men's well-being at midlife is influenced by the closeness to their child(ren), perceived closeness to their wife and the number of close friends.

Support from others can be financial or practical help or ideological support provided in the form of companionship. Support, and in particular financial support, and contact are different aspects. On the one hand, people may get (financial) support from a relative or friend they do not meet or hear from very often. On the other hand, people might not get (financial) support from someone with whom they have frequent contact.

We assume that ideological support and contact are closely linked, especially at older ages. Having frequent contact with someone might

indicate the concern of others but also a person's concern about others. In any case, it indicates integration into society.

We analysed the determinants of negative mental health among elderly with a special focus on their social environment, i.e. the elderly's children, their number, place of residence and the frequency of contact. We wanted to find out whether the existence of children, their proximity and the frequency of contact had an impact on the mental health of persons aged 60 and above. The contact with children might be of a different quality as compared to that with friends or neighbours. We assumed that elderly persons who have frequent contact with their children were also emotionally supported by their offspring and got help and encouragement when they were physically and/or mentally ill.

4 DATA AND VARIABLES

The *Survey of Health, Ageing and Retirement in Europe* (SHARE) includes accurate cross-national information, among other things on health, well-being, economic circumstances and social networks for the following ten continental European countries: Austria, Denmark, France, Germany, Greece, Italy, The Netherlands, Sweden, Switzerland and Spain. It aims at understanding the ageing process in Europe in order to turn "potential challenges into chances" (Börsch-Supan 2005, p. 1). The data were collected between April and October 2004.

SHARE covers the non-institutionalised population aged 50 and older.¹ Since spouses of persons aged 50 and more were also interviewed,

¹ Collecting SHARE data was primarily funded by the European Commission under its 5th Framework Programme (project QLK6-CT-2001-00360, thematic programme area: 'Quality of Life'). Additional funding came from the US National Institute on Ageing (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, Y1-AG-4553-01 and OGHA 04-064). In Austria, the data collection was mainly funded

some persons were younger than 50. “Release 1” comprised data on 22,777 individuals in 15,537 households. The weighted average response rate was 61.8 percent. It was lowest in Switzerland (37.6 percent) and highest in France (73.6 percent). The within-household response rate² was 86.0 percent, with the lowest values in Spain (74 percent) and the highest in Denmark (93 percent) (Börsch-Supan and Jürges 2005b, p. 100). Departing from the *English Longitudinal Survey on Ageing* (ELSA) and the US *Health and Retirement Study* (HRS), SHARE is a “multidisciplinary enterprise with a strong emphasis on looking always from at least three angles: economics, health, and social networks” (Börsch-Supan and Jürges 2005a, p. 18). SHARE was designed as a longitudinal survey, the next wave will be done in autumn 2006. Three new countries, namely the Czech Republic, Ireland and Poland will also participate in this wave.

The lack of comparable data for assessing differences in mental health between different communities across Europe has been pointed out on several occasions (e.g., Copeland et al. 1999a; EC 2004a). Although some international surveys include mental health measures, “the differences in survey techniques and research methods as well as non-representativeness of the total population in a country make real comparison almost impossible” (EC 2004b, p. 18). Moreover, methodological differences between studies do not allow us to draw conclusions about cross-cultural and geographical variation (Beekman et al. 1999). SHARE contains these missing European data that let us compare the health status in a variety of countries and permit us to analyse the determinants of health in a very broad context. Moreover, SHARE includes representative samples of the total population and is not restricted to some centres only. It enables us to study health issues, among

nationally by the Austrian Science Foundation (FWF, grant number P-15422).

² The within-household response rate is defined as the ratio between the number of responding individuals and the number of eligible persons in these households (Börsch-Supan 2005b, p. 99).

them also mental health conditions, of Europeans aged 50 years and older on a broad level, and is an appropriate dataset for answering complex questions on late-life depression and detecting geographical differences.

In our study, mental health was measured by the EURO-D scale. It was developed in a collaborative effort involving 11 European countries in order to compare symptoms of depression in 14 European centres (in Germany, Great Britain and The Netherlands two centres were involved). Five depression measures³ were harmonised into a 12-item scale (Prince et al. 1999a). The reliability of EURO-D has been reported to be good. With regard to validity, the scale was shown to correlate well with other well-known health measures (Prince et al. 1999a). The EURO-D is an internally consistent scale, captures the essence of its parent instruments, has been validated in a cross-European study of depression prevalence,⁴ and permits valid comparisons of risk factor associations between centres (Prince et al. 1999a). The EURO-D scale comprises the following 12 items: depression, pessimism, suicidality (wishing death), guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, tearfulness. The detailed

³ Geriatric Mental State-AGECAT (GMS-AGECAT), SHORT-CARE, Centre for Epidemiological Studies Depression scale (CES-D), Zung Self-Rating Depression Scale (ZSDS), Comprehensive Psychopathological Rating Scale (CPRS).

⁴ For reliability purposes, internal consistency was assessed by calculating the inter-item correlations, the item-total correlations and the standardised alpha values. “In each centre, the EURO-D seemed to be adequately internally consistent, although the inter-item and item-total correlations and the standardised alpha value were higher for the CES-D EURO-D than for the GMS EURO-D” (Prince et al. 1999a, p. 333). The criterion validity of the EURO-D scales was assessed by comparing the EURO-D scale with the CES-D, CIDI, GMS-AGECAT or CES-D scales. “Agreement with continuous measures was assessed by Spearman non-parametric correlations, and for dichotomous measures by the area under the receiver operating characteristic curve” (Prince et al. 1999a, p. 332).

questions are listed in Appendix 1. The EURO-D is a continuous measure of depressive symptoms; its score ranges from 0 to 12, with higher scores indicating higher levels of depression. EURO-D is implemented in the SHARE dataset. Dewey and Prince (2005) suggest to set a threshold at score 3 and to define clinically significant depression as a EURO-D score higher than 3. The EURO-D was internally consistent for all countries, with Cronbach alpha being 0.74 for the current pooled sample, ranging from 0.62 (in Switzerland) to 0.78 (in Spain). Thus, EURO-D is a reliable instrument for evaluating different dimensions of mental health.⁵

Table 1 shows the distribution of symptoms of depression incorporated in EURO-D for women and men aged 60 and over who are neither employed nor unemployed. Working conditions and unemployment might have a negative effect on mental health. Since the focus of the present study is on the mental health of elderly who are outside the labour force, we excluded employed and unemployed individuals from all parts of our analysis.

It is evident from Table 1 that the prevalence of depressive symptoms varies across countries. Depressive mood was reported by about one third of all elderly in Austria, Sweden and Denmark, but by 44 percent to 47 percent in Switzerland, Italy, Germany, Spain, and France. With values of 38 percent and 39 percent, respectively, Greece and The Netherlands were somewhere in between these two groups. Elderly in Denmark, Switzerland, Germany, Sweden and The Netherlands rarely reported pessimistic attitudes, whereas one out of three Austrian, Italian, French and Spanish elderly admitted to have no hopes for the future. With two out of ten who had no hopes for the future Greek elderly once more were somewhere in between these groups.

⁵ SHARE also includes the assessment of lifetime depressive episodes, treatment for depression and hospitalisation due to depression. In our paper, we do not analyse these aspects.

Table 1 EUROD depression symptoms, prevalence of depressive symptoms by countries

	AT	CH	DE	DK	ES	FR	GR	IT	NL	SE	Total
Depression	0.32	0.44	0.46	0.34	0.47	0.47	0.38	0.45	0.39	0.36	0.45
Pessimism	0.28	0.11	0.12	0.07	0.34	0.31	0.18	0.29	0.15	0.14	0.23
Suicidality	0.05	0.06	0.12	0.08	0.15	0.15	0.09	0.08	0.07	0.06	0.13
Guilt	0.32	0.06	0.06	0.07	0.07	0.11	0.07	0.09	0.09	0.08	0.07
Sleep	0.31	0.29	0.37	0.27	0.39	0.41	0.30	0.35	0.29	0.34	0.36
Interest	0.08	0.04	0.09	0.08	0.22	0.09	0.13	0.15	0.10	0.12	0.12
Irritability	0.10	0.18	0.13	0.18	0.27	0.28	0.22	0.30	0.18	0.19	0.23
Appetite	0.09	0.07	0.11	0.09	0.21	0.11	0.12	0.14	0.09	0.09	0.13
Fatigue	0.30	0.29	0.33	0.32	0.52	0.37	0.31	0.37	0.31	0.40	0.37
Concentration	0.20	0.18	0.24	0.13	0.41	0.29	0.29	0.33	0.23	0.18	0.29
Enjoyment	0.19	0.12	0.12	0.14	0.20	0.14	0.18	0.33	0.15	0.13	0.19
Tearfulness	0.20	0.22	0.34	0.16	0.38	0.29	0.37	0.27	0.31	0.23	0.31
EURO-D (mean)	2.15	2.02	2.46	1.93	3.63	3.01	2.61	3.15	2.33	2.31	2.86
EURO-D without somatic symptoms	1.49	1.39	1.66	1.25	2.50	2.13	1.88	2.28	1.64	1.47	1.99

Source: SHARE, household respondents aged 60 and older who are neither employed nor unemployed, weighted sample (calibrated individual weights applied, analytical weights)

In all SHARE countries, less than 10 percent of the elderly said they felt that they would rather be dead, except in Germany, France and Spain where 12 percent to 15 percent admitted suicidal feelings or the wish to be dead within the last month. Though these feelings are not identical with attempts to commit suicide, they capture the general feeling of longing to be dead. The high prevalence in Germany, France and Spain may also indicate that this question is perceived differently in these two countries and might reflect cultural differences. Feelings of guilt were of comparatively low importance, and ranged from 6 percent (Germany, Switzerland) to 11 percent (France), with the exception of Austria where one third of all individuals aged 60 and above reported to feel guilty or to blame themselves.

We found differences in the prevalence of various somatic features of depression (sleep disturbance, appetite). In France, Spain, Germany and Italy complaints about sleep disturbance were more frequent (35 percent to

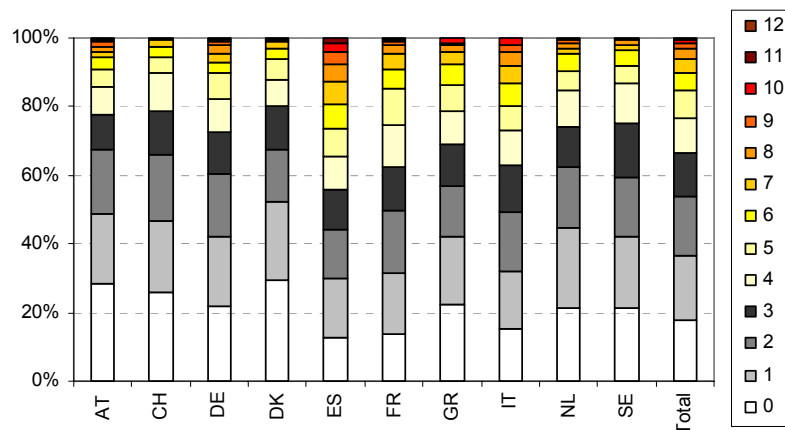
41 percent), Spain was an outlier concerning diminished appetite (21 percent as compared to about 10 percent in the other countries). Moreover, energy loss (fatigue) was surprisingly frequent in Spain (52 percent) but also in Sweden, Italy and France (37 percent to 40 percent). In all countries except Spain (22 percent), Greece (13 percent) and Italy (15 percent), up to 10 percent of all elderly mentioned comparably little interest in things. Copeland et al. (1999b, p. 328) argue that somatic symptoms such as loss of appetite, sleep disturbance, loss of energy and feeling exhausted “should be avoided when assessing depression in older age because of the possibility of confounding them with symptoms of physical illness”. They conclude that if these symptoms were a serious problem, they would become more frequent with age, but they found no substantial differences between age groups for most symptoms. Following their suggestion, we left out somatic symptoms in one model when calculating the level of depression. The results are presented in the next section, but we already want to mention here that our results remained stable.

Our descriptive analyses showed big differences in the feeling of irritability. The highest figures were reported in Italy, France and Spain (27 percent to 30 percent) and the lowest in Austria (10 percent). Problems with concentration were most frequent in the southern countries (Spain 41 percent, Italy 33 percent, Greece 29 percent, France 29 percent) and least frequent in Denmark (13 percent). Concerning enjoyment, one out of three Italians and two out of ten Spaniards, Austrians and Greek failed to mention any enjoyable activity; in the remaining countries the percentages were very similar, i.e., between 12 percent and 14 percent. Tearfulness was another aspect included in the EURO-D depression scale. We found a rather high proportion of elderly in Spain and Greece who said to have cried during the last month (38 percent and 37 percent, respectively). In the remaining countries covered by SHARE, the percentages ranged from 16 percent in Denmark to 34 percent in Germany.

The highest levels of depressive symptoms were recorded in Spain, Italy, France and Greece. The lowest levels were found in Denmark (Table

1). It is interesting to see that the highest levels of depressive symptoms are found in the southern countries of Europe. Despite the fact that the climate is sunnier in these countries, more people suffer from depressive symptoms there. This could be due to a more difficult economic situation. The mean of EURO-D ranges from 1.93 (Denmark) to 3.63 (Spain). As mentioned earlier, Dewey and Prince (2005) suggest to set a threshold at score 3 and define clinically significant depression as a EURO-D score greater than 3. We concentrated on the continuous variable EURO-D instead of the dichotomous one, as it allows a more precise analysis, which, moreover, is not dependent on a threshold. Figure 2 shows the distribution of depressive symptoms across the 10 countries that participated in the first wave of SHARE.

Figure 2 Distribution of number of depressive symptoms



Source: SHARE, household respondents aged 60 and older who are neither employed nor unemployed, weighted sample (calibrated individual weights applied, analytical weights)

In order to investigate the effect of children, our models included the number of children, their place of residence and the contact with children, i.e., the most frequent contact with up to four children. In SHARE, accurate information on a child (marital status, partner, transition to adulthood,

employment status, education, frequency of contact with child) is available for up to four children.⁶ If a respondent had more than four children, the data on the children of higher order were limited to basic facts (natural child, gender, year of birth, place of residence). Furthermore, no information on dead children was collected.

In addition to children, our analysis included socio-economic variables that were found to have an effect on mental health: age, sex, family status (living together with a spouse or a partner, never married and living as a single, divorced and living as a single, widowed and living as a single),⁷ and the respondent's highest educational level (primary school (ISCED 0-1), lower secondary (ISCED 2), upper secondary (ISCED 3-4) and tertiary education (ISCED 5-6)).

Table 2 shows the characteristics of the study sample. Our selected sample included 9,020 individuals (unweighted), with a preponderance of women (71 percent). The mean age was 72.5 years, with the majority of the respondents (42 percent) being between ages 60 and 69. When the interview was made, the majority (47 percent) lived with a spouse or a partner, about 3 out of 10 were widowed and lived without a (new) partner, 6 percent were divorced and lived without a partner, another 9 percent had never been married and lived without a partner. Our sample adequately reflects the living conditions among elderly people, with a high proportion of widowed persons, especially among women, which is typically found in all sample countries (results not shown here). In our sample, 4 out of 10 respondents

⁶ The four children were selected as follows: The oldest four children living closest to their parents were chosen (see SHARE homepage, readme.txt).

⁷ Methodological issue: The data are inconsistent for the two variables "mstat" and "dn014". According to the Mannheim Research Institute for Economics of Ageing (MEA), the information in the DN-module is more reliable, because the DN-module was answered by the individuals themselves whereas the CV-module, which includes the variable "mstat", was answered by a representative of the household. For the 17 inconsistent cases we only used the information in the DN-module.

had finished primary school or had a lower level of education, 19 percent had completed lower secondary education, 27 percent had upper secondary education and 11 percent were in the highest educational group with some kind of tertiary education.⁸

In our data, 17 percent of the respondents were childless, 20 percent had one child, 31 percent two children, 18 percent three children and 15 percent had four or more children. We observed a high degree of local proximity of elderly people and their children. With the exception of Denmark, at least half of all elderly parents had a child who lived at a maximum distance of five kilometres, and in all countries, three out of four respondents had a child who lived at most 25 kilometres away.

Moreover, we found that the elderly in Europe had frequent contact with their children. As mentioned earlier, 17 percent of our sample were childless, 26 percent had at least one child and lived together with a child in the same home or household, another 23 percent had at least one child and had daily contact with at least one of their children. One out of three was a parent and had contact with his/her child(ren) several times a week or weekly. Only a small group of people had little contact with their child(ren): 5 percent had child(ren) and had contact with them less than once a week.

⁸ The Austrian data showed differences in the distribution of the educational level. Compared to the microcensus 2003, higher educational groups are overrepresented in the Austrian SHARE data. This phenomenon is frequently observed in surveys and might also hold true for other countries.

Table 2 Distribution of variables

	AT	CH	DE	DK	ES	FR	GR	IT	NL	SE	Total
Number of children											
Childless	16%	16%	17%	12%	15%	16%	11%	21%	13%	13%	17%
1 child	24%	21%	23%	13%	15%	19%	17%	20%	11%	17%	20%
2 children	33%	30%	31%	38%	28%	27%	46%	32%	32%	36%	31%
3 children	16%	18%	17%	20%	19%	20%	18%	16%	21%	20%	18%
4+ children	10%	15%	11%	16%	22%	19%	8%	12%	23%	14%	15%
Location of closest child											
Childless	16%	16%	17%	12%	15%	16%	11%	21%	13%	13%	17%
In same household	13%	9%	8%	3%	32%	9%	20%	26%	6%	2%	16%
In same building	14%	8%	15%	2%	6%	3%	18%	15%	1%	1%	10%
Less than 1 km away	13%	12%	14%	17%	23%	13%	19%	12%	21%	17%	15%
Between 1 and 5 km away	16%	17%	17%	20%	11%	18%	13%	13%	32%	23%	16%
Between 5 and 25 km away	13%	20%	14%	26%	5%	19%	10%	7%	15%	20%	12%
Between 25 and 100 km away	7%	10%	7%	13%	2%	11%	3%	3%	8%	13%	6%
Between 100 and 500 km away	5%	6%	6%	6%	4%	7%	5%	1%	3%	8%	5%
More than 500 km away	0%	1%	1%	0%	1%	3%	1%	2%	0%	2%	1%
More than 500 km away in another country	1%	1%	1%	1%	1%	1%	1%	1%	0%	1%	1%
Contact with child(ren)											
Childless	16%	16%	17%	12%	15%	16%	11%	21%	13%	13%	17%
In same household	27%	17%	23%	5%	37%	12%	38%	41%	7%	3%	26%
Daily	17%	14%	18%	25%	29%	24%	32%	25%	28%	28%	23%
Several times	30%	42%	35%	50%	16%	41%	17%	12%	46%	50%	28%
Less than weekly	9%	11%	8%	8%	3%	7%	2%	2%	5%	6%	5%

Table continued on next page

Table 2 continued

	AT	CH	DE	DK	ES	FR	GR	IT	NL	SE	Total
Family status											
Living with spouse or partner	42%	49%	46%	42%	48%	48%	45%	47%	47%	41%	47%
Never married and living without partner	9%	7%	9%	5%	9%	7%	4%	13%	7%	8%	9%
Divorced and living without partner	9%	9%	7%	16%	2%	9%	5%	3%	9%	14%	6%
Widowed and living without partner	40%	35%	38%	37%	40%	36%	47%	37%	37%	37%	38%
Mean age	71.6	72.9	71.9	73.2	73.5	73.2	72.1	72.0	72.5	75.0	72.5
Sex											
Male	42%	46%	37%	40%	40%	43%	40%	37%	41%	40%	39%
Female	58%	54%	63%	60%	60%	57%	60%	63%	59%	60%	61%
Highest educational level											
Primary school	0%	27%	1%	0%	80%	57%	70%	66%	29%	55%	43%
Lower secondary	38%	33%	28%	38%	12%	9%	9%	15%	40%	14%	19%
Upper secondary	45%	20%	53%	40%	3%	20%	14%	15%	19%	18%	27%
Tertiary	17%	21%	18%	22%	5%	13%	7%	5%	12%	13%	11%
Number of observations	994	357	1,175	617	1,135	682	835	1,131	1,002	1,092	9,020

Source: SHARE, household respondents aged 60 and older who are neither employed nor unemployed, weighted sample (calibrated individual weights applied, analytical weights)

Considering parents only, we found that 31 percent were sharing a home or the household with a child, 28 percent had daily contact with their child(ren), one out of three had frequent contact with their child(ren) and saw or heard them several times a week or weekly, whereas 7 percent had only little contact with their child(ren) and saw or heard them less than once a week. We found that the contact of elderly people with their children varied within Europe: in Italy, Spain and Greece, the elderly frequently lived with their children (42 percent-55 percent), which was very rare in such northern countries as Sweden and Denmark (3 percent and 5 percent, respectively) (see also Hank 2007). Nevertheless, we found that elderly parents in Europe still had frequent contact with their children, even if they lived at a considerable distance, as the proportion of elderly having at least weekly contact with their child(ren) was 93 percent, being lowest in Switzerland (87 percent) and highest in Greece (98 percent).

5 MULTIVARIATE RESULTS

To estimate the effects of children on mental health by controlling for sex, age, family status, and highest educational attainment, we estimated a multivariate linear regression model with the EURO-D scale as dependent variable. To account for country heterogeneity, we included only country dummies in the first step. In the next step, we accounted for individual heterogeneity regarding the number of children (Table A1), location of the closest child (Table A2) and contact with children (Table A3). Then we included control variables step by step to see if they had an effect on the mental health of the elderly, and if the effect of the main variables of interest changed in magnitude and significance when a new variable was introduced.

When limiting the analysis to the effect of countries, we found significantly higher levels of depression in Spain, Italy, France and Greece (Model 1 in Table A1-A3). Especially for Spain, the magnitude of the country effect was surprising. This first result concerns the frequency of

depressive symptoms. The high levels in Italy, France and Greece are in line with findings based on Eurobarometer data (EORG 2003).

We found that up to parity three, the number of children had a protective effect on the elderly's mental health. Elderly people with up to three children had fewer depressive symptoms than childless elderly and parents of four or more children. This effect vanished when controlling for socio-economic variables, and we conclude that the number of children does not play an important role for the mental health of elderly (Table A1).

The local proximity of children had no effect on the mental health of their parents. Childless elderly had more depressive symptoms as compared to parents, but our analysis showed no special pattern for a correlation between local proximity of children and depressive symptoms of their parents (Table A2).

While the number of children and their local proximity turned out to have no significant effect on their parents' mental health, we found a significant effect of the contact with children (Table A3). We detected a protective effect, since parents who saw their child(ren) less than once a week as well as childless persons had significantly higher levels of depression. Surprisingly, parents who lived with their children also had significantly higher levels of depression. We suppose that this result reflects the causal relationship between parents' mental and/or physical health and co-residence with a child. We assume that part of these elderly persons lived with their child because they had physical and/or mental health problems. Unfortunately, our data do not permit us to disentangle the direction of causality.

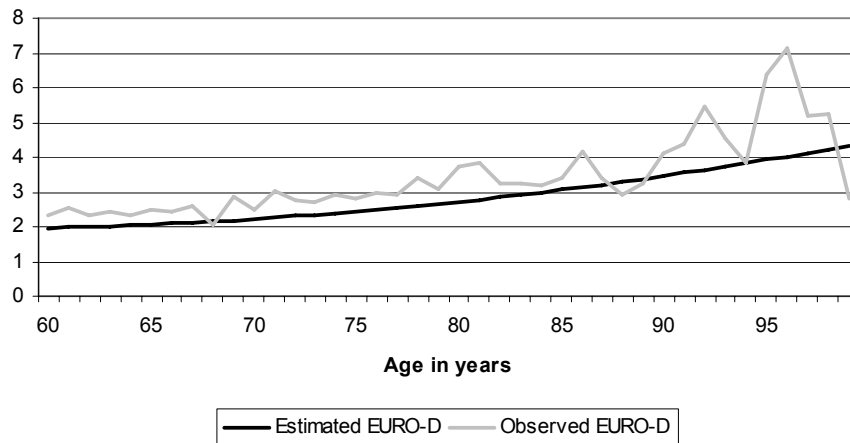
We next included family status in our models and distinguished between elderly who lived with a spouse or a partner and those who lived without a partner. By controlling for family status, we indirectly controlled for the support of a partner. In line with previous research, our data showed a strong protective effect of family status on mental health (Table A3, model 3). Elderly people who lived with a spouse or a partner had the lowest levels of depression. Divorced and widowed elderly who did not live together with

a partner at the time of the interview had significantly higher levels of depression. The same held true for never married persons who had no partner with whom they shared the household. When limiting the analysis to persons without a partner, divorce seemed to have a stronger effect on depressions as compared to widowhood.

With the introduction of family status, the effect of contact with chil(ren) decreased in magnitude and significance (Table A3, model 4). Nevertheless, a protective effect remained, since those who had rather few contacts with their children still had a higher level of depression, though the effect was no longer statistically significant. Childless persons also had higher levels of depression, but the effect was smaller and no longer significant.

Our analysis shows that age has a significant negative effect and age squared has a significant positive effect on the mental health of elderly people (Table A3, model 5). The non-linear effect of age on the level of depression is depicted in Figure 3 and shows that the level of depression increases with age.

Figure 3 Observed and estimated effect of age on the level of depression



Source: SHARE, household respondents aged 60 and older who are neither employed nor unemployed

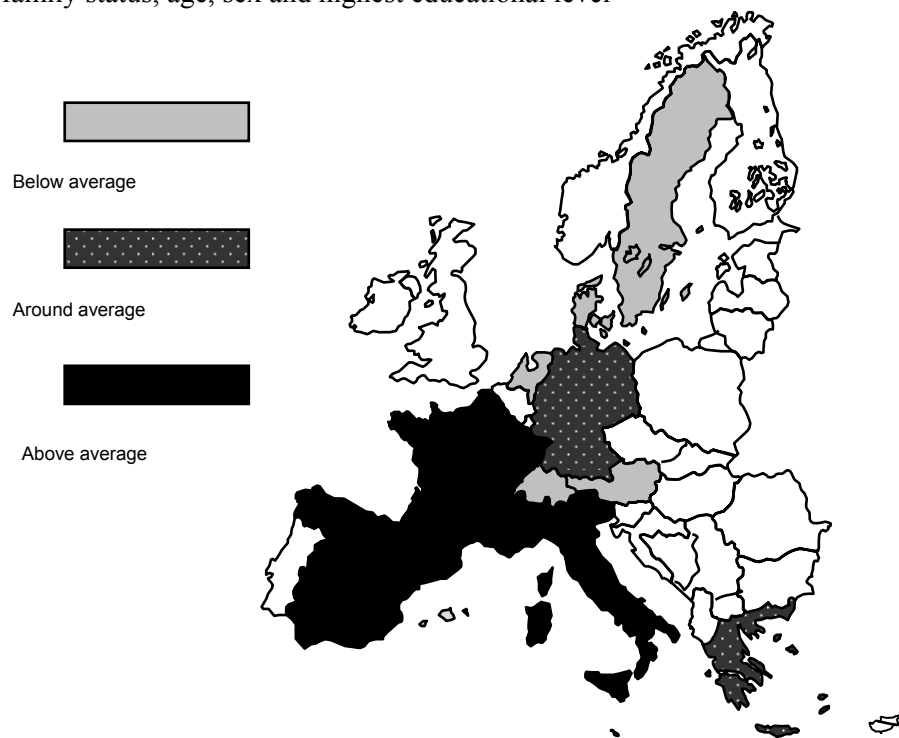
Remark: The regression model includes only one constant, age and age². The estimated effect of age is $y = 0.12/100 \cdot x^2 - 0.13x + 5.44$.

The estimated coefficients show a significant effect of gender, with women having a markedly poorer mental health than men. Interestingly, with the inclusion of gender, the effect of family status weakened, whereas the effect of contact with children became stronger: Very few contacts with children once more had a stronger and more significant effect. These observations indicate an interaction effect between a person's sex, family status and contact with children (Table A3, model 6). Moreover, we found a strong effect of education. With increasing educational level, the risk of depression decreased significantly (Table A3, model 7). This confirms the expected correlation between educational level and mental health. Higher educated persons generally have a better health and a lower mortality (Mackenbach et al. 1999; Doblhammer et al. 2005).

Finally, it is of interest whether the country-specific effects change when controlling for children, age, sex, and highest educational attainment. We therefore compared the country-specific effects in Model 1 and Model 7 (Table A3). Our results indicate that even when controlling for the above-mentioned determinants of mental health, Spain, Italy and France still had high levels of depression. Although the effects partly diminished, they still remained strong and significant. Elderly in Denmark seemed to be least depressed, since the non-explained country-effect for Denmark was negative and significantly differed from the reference group (Austria).

Figure 4 displays the country specific effects under control of contact with children, family status, age, sex and highest educational level. The displayed coefficients are obtained for effect-coded countries by two separate estimation procedures with changing omitted categories. The coefficients of effect coded variables can be interpreted as deviations of the country-specific means of depression from the grand mean, i.e. the mean of all countries. Under control of individual heterogeneity, Spain, Italy and France belong to the countries with high levels of depressive symptoms, Germany and Greece to the countries with a medium level and Sweden, Denmark, The Netherlands, Austria, Switzerland belong to the countries with low levels of depression.

Figure 4 Country-specific effects by controlling for contact with children, family status, age, sex and highest educational level



Remark: The displayed effects are estimated with effect coded countries; calculations are based on model 7, in Table A3.

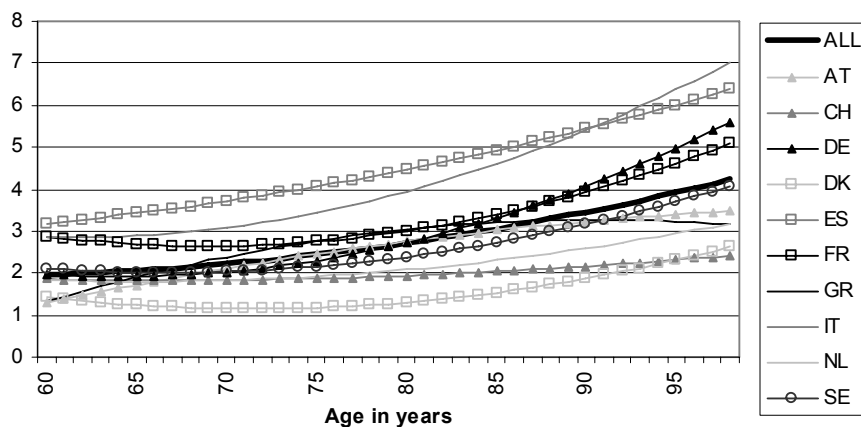
To see whether the intensity of the correlation between contact with children and mental health differs across European countries, we estimated the full model separately for each country in the next step. As can be seen in Table A4, the estimated coefficients of the contact with children did not differ with respect to the sign but with respect to the magnitude. In a few countries, the estimated coefficients differed in signs, however, they were not significantly different from zero.

The same result held true for respondents' sex, family status and highest educational attainment. Across all countries included in the analysis, females had more problems with mental health than males. Analyses based

on Eurobarometer data found remarkable gender-specific differences in terms of higher female to male ratios for Italy and Portugal (Copeland et al. 1999a). Our country-specific analyses showed exceptionally great gender differences in Spain and big differences in France, Italy and Greece.

At first sight, the estimated effect of age seems to be somewhat puzzling. As suggested by the full model for all countries, the coefficients are supposed to be negative for age and positive for age squared. This held true for all countries except Greece, where our results indicated a positive effect for age and a negative effect for age squared. We calculated the model separately with age only and age squared for all countries and found that the level of depression increased with age also for Greece, but decreased slightly only after the age of 92, a very high age indeed. We assume that these results might be due to some very old outliers. The effect of age was most pronounced in Spain and Italy where depressive symptoms increased fastest with age (Appendix Figure A1). Finally, it should be mentioned that part of the differences or variations in the magnitude of the effects may be explained by poor response rates in some countries.

Figure 5 Country-specific estimated effect of age on the level of depression



Source: SHARE, household respondents aged 60 and older who are neither employed nor unemployed

Remark: The regression models include only a constant, age and age².

In all ten countries participating in SHARE, persons who lived without partner had poorer mental health than those living with a partner. The negative effect of widowhood on mental health was very pronounced in The Netherlands, France, Germany and Greece. Moreover, educational differences were larger in Germany and Spain where elderly with tertiary education were much less affected by depressive symptoms as compared to those who had completed primary education.

As there might be doubts whether the 12 items contributing to the EURO-D scale have an effect on our results, we used different measures for depression. In one model, we excluded the question on depression in our analysis. One might argue that asking directly for a depression will lead to underreporting. In another model, we left out the item on interest, because we think that loss of interest is not necessarily an indicator for depression, especially at older ages. Following the idea of Copeland et al. (1999b) who argue that somatic symptoms should be avoided when assessing depression in older age, we left out the somatic symptoms when calculating the level of depression in the third model. Our results show that the effect of our variables is slightly less pronounced but does not change substantially (Table A5). We want to stress that an analysis of different definitions of depressive symptoms clearly shows that our results are stable and do not depend on the 12 contributing items. Moreover, we estimated a model with the direct question on depression only and found that country, family status, sex, age, contact with children and educational level had no significant effect in this model.

Depression is not an isolated illness but also occurs along with other health problems, and in particular physical illness (Copeland et al. 1999a). Physical and mental health are linked, and it is difficult to entangle how they interrelate. Poor physical health is an important risk factor for depression in later life (Lenze et al. 2001). Braam et al. (2005) found a consistent link between physical health and depressive symptoms in later life across western Europe. We included several health measures such as self-perceived health, chronic diseases and limitations in ADL (activities of daily living). It turned

out that these variables had a strong impact on mental health. Since it is not possible to disentangle the causality, we finally did not include a health indicator in our analyses. Moreover, in one of our models, we included rural and urban environment and found significantly higher levels of depression in urban settings. In the end, we dropped this variable for the sake of parsimonious modelling. Moreover, long-lasting difficulties such as disability of a close relative can result in chronic mental disorders. We did not include this aspect in our analysis.

6 DISCUSSION

Depression and dementia are the two most important mental illnesses in later life (Copeland et al. 1999b). Findings on increased depression in later life are controversial. Weissman et al. (1988) found for the US that late-life depression was not as frequent as previously believed and was no more frequent among the elderly than at earlier ages. Our results clearly indicate an increase in depression with age, which was found in all ten European countries covered by SHARE.

Our paper focuses on children's impact on the mental health of elderly and finds an indicator for a protective function of children. On the one hand, childless people have higher levels of depression, on the other hand few contacts with children also have a negative effect on the mental health of elderly parents. One might argue that the frequency of contact does not tell anything about its quality and the quality of the relationship between old parents and their adult children. Elderly might have frequent contact with their children, either because their children visit or call them regularly or because the parents call and visit their children. Moreover, the reason for seeing and hearing each other does not have to be joyful, it might also be a conflict or a dispute. SHARE does not include information on the quality of the contact with the children, but we argue that the frequency of contact with a child is more a sign of integration into the family, whereas very little

contact with one's children might also be interpreted as a sign of disinterest and lack of love for old parents. In view of the decreasing fertility in western societies, we thus expect mental health to deteriorate.

Our analysis clearly shows that the nuclear family has a powerful effect on mental health. Another interesting result is the fact that the presence of a spouse or partner has a much stronger protective effect on the mental health of elderly than the presence of or the contact with children. We conclude that the presence of a partner is more important for the mental health of an elderly person than the existence of and contact with their children, because partners are around the whole day, and the elderly have someone they can talk to and share their daily lives with. Nevertheless it has to be underlined that social networks, and especially close, confiding relationships, can be both protective and risk factors. The death of a close person, e.g., a partner, child, relative or friend, the loss of a partner or one's job might trigger a depression.

The true prevalence of depression in late life is difficult to specify. In a review of community prevalence of depression in later life (55+), Beekman et al. (1999) found an enormous variation of prevalence rates according to the level of caseness. Distinguishing between major and minor depression, they found that major depression was relatively rare among the elderly (weighted average prevalence 1.8 percent), minor depression was more common (weighted average prevalence 9.8 percent), while all depressive syndromes deemed clinically relevant yielded an average prevalence of 13.5 percent. They concluded that "methodological differences between studies preclude firm conclusions about cross-cultural and geographical variation" (Beekman et al. 1999, p. 307).

The presence of cultural differences is definitely a main aspect in any international and cross-cultural analysis. People from different cultural backgrounds might understand and interpret terms and concepts differently, which might cause variation across the participating countries (Bardage et al. 2005, Lehtinen et al. 2005). Therefore, the differences in mental health might be "mainly due to methodological/cultural biases, but of course they

can also indicate true differences between countries” (Lehtinen et al. 2005, p. 5).

Börsch-Supan et al. (2005) address the role of reporting styles and their impact on cross-country differences in self-assessed health. Analysing self-reported health, they pose the question if “in the light of [...] large cross-country differences, it is natural to ask if they can be taken at face value”. Comparability of health measures across groups of individuals might be doubtful because (1) scales are not absolute, (2) response categories may also have different connotations and (3) “individuals with the same health status may have different reference levels against which they judge their health” (ibid, p. 250).

They compute a more objective standardised health index and identify a large group with very similar median health including all SHARE countries except France, Italy and Spain, which turn out to be the least healthy countries according to their standardised health index. In a next step, they calculate country-specific reporting thresholds and find remarkable differences in reporting styles across the SHARE countries. Given the health index and the reporting thresholds, they “purge the self-reported health ratings from cross-national differences in habitual language use simply by using the same threshold (SHARE average) for each respondent, say the SHARE average” (ibid, p. 251). They find that Scandinavians (Danish and Swedish) have a more positive attitude towards their health and systematically overvalue their health compared to the SHARE average. Germans, Dutch, and Swiss are less positive and tend to undervalue their health, whereas differences between reported and adjusted health levels are unsystematic in the Mediterranean countries and Austria.

Börsch-Supan et al. (2005) analysed self-perceived health whereas our study concentrated on mental health. Nevertheless, the question of comparability among countries is also an important issue in our study. In the light of the results by Börsch-Supan et al. (2005), our findings tend to be robust: France, Italy and Spain turned out to be the least healthy countries according to Börsch-Supan et al. (2005) and had the highest levels of

depression in our analyses. Moreover, respondents in these countries do not systematically undervalue their self-perceived health and we may assume that this holds true not only for self-perceived health but also for questions on mental health.

The symptoms of depression included in our analyses were chosen by an international consortium including physicians. Admitting to feel sad and depressed, to have problems with sleeping, the wish to be dead and tearfulness are clearly signs of depression and having several of these symptoms is obviously a sign of bad mental health. On its homepage, The National Institute of Mental Health lists ten symptoms, all of which are included in our analysis. It recommends that “[i]f five or more of these symptoms are present every day for at least two weeks and interfere with routine daily activities such as work, self-care, and childcare or social life, seek an evaluation for depression” (www.nimh.nih.gov/publicat/depcancer.cfm).

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APPENDIX: 12 items contributing to the EUROD-scale

The names of variables coded in the SHARE data are given in brackets. For further details see SHARE Codebook (Buber 2006).⁹

1. Depression (mh002)

“In the last month, have you been sad or depressed?”

Yes

No

2. Pessimism (mh003)

“What are your hopes for the future?”

Any hopes mentioned

No hopes mentioned

3. Suicidality (mh004)

“In the last month, have you felt that you would rather be dead?”

Any mention of suicidal feelings or wishing to be dead

No such feelings

4. Guilt (mh005 and mh006)

“Do you tend to blame yourself or feel guilty about anything?”

Obvious excessive guilt or self-blame

No such feelings

Mentions guilt or self-blame, but it is unclear if these constitute obvious or excessive guilt or self-blame

“So for what do you blame yourself?”

Example(s) given constitute obvious excessive guilt or self-blame

Example(s) do not constitute obvious excessive guilt or self-blame, or it remains unclear if these constitute obvious or excessive guilt or self-blame

⁹ For the items “guilt”, “interest” and “appetite”: those who gave a non-specific response or an unclear answer were asked a second question.

5. Sleep (mh007)

“Have you had trouble sleeping recently?”

Trouble with sleep or recent change in pattern

No trouble sleeping

6. Interest (mh008 and mh009)

“In the last month, what is your interest in things?”

Less interest than usual mentioned

No mention of loss of interest

Non-specific or uncodeable response

“So, do you keep up your interests?”

Yes

No

7. Irritability (mh010)

“Have you been irritable recently?”

Yes

No

8. Appetite (mh011 and mh012)

“What has your appetite been like?”

Diminution in desire for food

No diminution in desire for food

Non-specific or uncodeable response

“So, have you been eating more or less than usual?”

Less

More

Neither more nor less

9. Fatigue (mh013)

“In the last month, have you had too little energy to do the things you wanted to do?”

Yes

No

10. Concentration (mh014 and mh015)¹⁰

“How is your concentration? For example, can you concentrate on a television programme, film or radio programme?”

Difficulty in concentrating on entertainment

No such difficulty mentioned

“Can you concentrate on something you read?”

Difficulty in concentrating on reading

No such difficulty mentioned

11. Enjoyment (mh016)

“What have you enjoyed doing recently?”

Fails to mention any enjoyable activity

Mentions any enjoyment from activity

12. Tearfulness (mh017)

“In the last month, have you cried at all?”

Yes

No

¹⁰ Those who replied they found it difficult to concentrate in one of the two questions were coded as having problems with concentration.

Table A1 Mental health among elderly: Effect of number of children

	Model 1	Model 2	Model 3	Model 4	Model 4	Model 6
Country						
Austria (AT)	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Switzerland (CH)	-0.12	-0.13	-0.05	-0.12	-0.08	-0.18
Germany (DE)	0.14	0.15	0.33***	0.32**	0.27**	0.29**
Denmark (DK)	-0.21+	-0.20+	-0.23*	-0.31**	-0.33**	-0.31**
Spain (ES)	1.49***	1.47***	1.62***	1.55***	1.48***	1.17***
France (FR)	0.88***	0.87***	0.92***	0.87***	0.86***	0.67***
Greece (GR)	0.56***	0.60***	0.55***	0.52***	0.50***	0.24*
Italy (IT)	1.02***	1.02***	1.20***	1.20***	1.14***	0.85***
Netherlands (NL)	0.05	0.05	0.22*	0.18+	0.16	0.05
Sweden (SE)	0.08	0.09	0.24*	0.14	0.11	-0.08
Number of children						
Childless		0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
1 Child		-0.06	-0.00	0.02	-0.01	-0.02
2 children		-0.28***	-0.15	-0.10	-0.09	-0.11
3 children		-0.16+	-0.03	0.01	0.00	-0.02
4+ children		0.05	0.12	0.14	0.14	0.09
Family status						
Living with spouse or partner			0 ^a	0 ^a	0 ^a	0 ^a
Never married, no partner			0.48***	0.41***	0.25*	0.24*
Divorced, no partner			0.80***	0.81***	0.62***	0.63***
Widowed, no partner			1.06***	0.84***	0.48***	0.46***
Age effect						
Age				-0.11*	-0.09+	-0.11*
Age*age/100				0.10**	0.09**	0.09**
Sex						
Male					0 ^a	0 ^a
Female					0.81***	0.77***
Highest educational attainment						
Primary school						0 ^a
Lower secondary						-0.30***
Upper secondary						-0.43***
Tertiary						-0.54***
Constant	2.10***	2.22***	1.62***	4.70**	2.58	3.76*
R ²	0.05	0.06	0.10	0.11	0.13	0.14
N	8,840	8,840	8,840	8,827	8,827	8,827

Legend: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001.

Source: SHARE, family respondents aged 60 and older who are neither employed nor unemployed

Table A2 Mental health among: Effect of location of child living closest

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Country						
Austria (AT)	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Switzerland (CH)	-0.12	-0.10	-0.03	-0.10	-0.06	-0.17
Germany (DE)	0.14	0.16	0.35***	0.34***	0.29**	0.30**
Denmark (DK)	-0.21+	-0.17	-0.21+	-0.29*	-0.30**	-0.30**
Spain (ES)	1.49***	1.45***	1.61***	1.52***	1.45***	1.14***
France (FR)	0.88***	0.92***	0.96***	0.91***	0.90***	0.69***
Greece (GR)	0.56***	0.55***	0.52***	0.49***	0.48***	0.22+
Italy (IT)	1.02***	0.97***	1.17***	1.17***	1.10***	0.81***
Netherlands (NL)	0.05	0.06	0.23*	0.19+	0.17+	0.05
Sweden (SE)	0.08	0.13	0.27**	0.17+	0.14	-0.06
Location of child living closest						
Childless		0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
In same household		0.02	0.10	0.16	0.17	0.14
In same building		-0.14	-0.09	-0.08	-0.11	-0.16
Less than 1 km away		-0.13	0.00	0.03	0.02	-0.03
Between 1 and 5 km away		-0.12	-0.01	0.03	0.03	0.01
Between 5 and 25 km away		-0.28**	-0.14	-0.10	-0.12	-0.13
Between 25 and 100 km away		-0.22+	-0.09	-0.07	-0.08	-0.07
Between 100 and 500 km away		-0.21	-0.07	-0.07	-0.04	-0.02
More than 500 km away		-0.72**	-0.57*	-0.53*	-0.45+	-0.41+
More than 500 km away in another country		-0.37	-0.22	-0.20	-0.21	-0.16
Family status						
Living with spouse or partner			0 ^a	0 ^a	0 ^a	0 ^a
Never married, no partner			0.49***	0.42***	0.26*	0.25*
Divorced, no partner			0.82***	0.84***	0.63***	0.64***
Widowed, no partner			1.07***	0.84***	0.48***	0.46***
Age effect						
Age				-0.10*	-0.07	-0.09+
Age*age/100				0.09**	0.08*	0.08**
Sex						
Male					0 ^a	0 ^a
Female					0.81***	0.77***
Highest educational attainment						
Primary school						0 ^a
Lower secondary						-0.30***
Upper secondary						-0.43***
Tertiary						-0.54***
Constant	2.10***	2.22***	1.61***	4.08*	1.92	3.12+
R²	0.05	0.06	0.10	0.11	0.13	0.14
N	8,840	8,821	8,821	8,808	8,808	8,808

Legend: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001.

Source: SHARE, family respondents aged 60 and older who are neither employed nor unemployed

Table A3 Mental health among elderly: Effect of contact with child(ren)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Country							
Austria (AT)	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Switzerland (CH)	-0.12	-0.09	-0.04	-0.03	-0.10	-0.06	-0.16
Germany (DE)	0.14	0.16	0.34***	0.34***	0.33***	0.28**	0.30**
Denmark (DK)	-0.21+	-0.16	-0.23*	-0.20+	-0.28*	-0.29*	-0.28*
Spain (ES)	1.49***	1.46***	1.64***	1.62***	1.53***	1.48***	1.16***
France (FR)	0.88***	0.92***	0.94***	0.95***	0.91***	0.90***	0.70***
Greece (GR)	0.56***	0.54***	0.53***	0.51***	0.47***	0.47***	0.21+
Italy (IT)	1.02***	0.98***	1.21***	1.18***	1.17***	1.12***	0.83***
Netherlands (NL)	0.05	0.11	0.24*	0.26*	0.22*	0.21*	0.09
Sweden (SE)	0.08	0.14	0.24*	0.27**	0.18+	0.15	-0.05
Contact with child(ren)							
Childless		0.27***		0.12	0.09	0.11	0.12
Children in hh or house		0.24**		0.15*	0.17*	0.17*	0.14*
Daily contact		0.14*		0.12+	0.13+	0.11+	0.09
Several times a week,		0 ^a		0 ^a	0 ^a	0 ^a	0 ^a
Less than weekly		0.19+		0.08	0.06	0.19+	0.20+
Family status							
Living with spouse or			0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Never married, no partner			0.52***	0.48***	0.42***	0.25*	0.24*
Divorced, no partner			0.80***	0.80***	0.82***	0.61***	0.62***
Widowed, no partner			1.07***	1.06***	0.83***	0.47***	0.45***
Age effect							
Age					-0.10*	-0.08	-0.10*
Age*age/100					0.09**	0.08*	0.09**
Sex							
Male						0 ^a	0 ^a
Female						0.82***	0.78***
Highest educational attainment							
Primary school							0 ^a
Lower secondary							-0.31***
Upper secondary							-0.44***
Tertiary							-0.54***
Constant	2.10***	1.95***	1.57***	1.49***	4.09*	1.97	3.24+
R ²	0.05	0.06	0.10	0.10	0.11	0.13	0.14
N	8,840	8,840	8,840	8,840	8,827	8,827	8,827

Legend: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001

Source: SHARE, family respondents aged 60 and older who are neither employed nor unemployed

Table A4 Mental health among elderly: Contact with child(ren), country-specific models

	ALL	AT	CH	DE	DK	ES	FR	GR	IT	NL	SE
Country											
Austria (AT)	0										
Switzerland (CH)	-0.16										
Germany (DE)	0.30**										
Denmark (DK)	-0.28*										
Spain (ES)	1.16****										
France (FR)	0.70****										
Greece (GR)	0.21+										
Italy (IT)	0.83****										
Netherlands (NL)	0.09										
Sweden (SE)	-0.05										
Contact with child(ren)											
Childless	0.12	0.26	-0.05	0.44*	0.11	0.48	0.10	0.26	-0.42	-0.08	-0.02
Children in household or house	0.14*	0.19	0.07	0.12	0.56	0.33	0.16	0.39+	-0.18	0.15	-0.08
Daily contact	0.09	-0.08	-0.10	0.20	0.16	0.11	0.15	0.51*	0.10	-0.01	-0.08
Several times a week or weekly	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Less than weekly	0.20+	0.46+	0.08	0.12	-0.01	0.32	0.18	0.41	-0.46	0.91**	-0.17

Table continued on next page

Table A4 continued

	ALL	AT	CH	DE	DK	ES	FR	GR	IT	NL	SE
Family status											
Living with spouse or partner	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Never married, no partner	0.24*	-0.09	0.59	0.17	0.07	-0.40	0.42	0.67	0.63	0.86*	0.32
Divorced, no partner	0.62***	0.66**	0.62+	0.12	0.60*	1.37*	0.43	1.17**	0.79	1.12***	0.32
Widowed, no partner	0.45***	0.31+	0.51+	0.57***	0.30	0.45*	0.59*	0.55**	0.32	0.65***	0.12
Age effect											
Age	-0.10*	0.21	-0.07	-0.29*	-0.26+	-0.07	-0.38*	0.41*	-0.36*	-0.13	-0.25*
Age*age/100	0.09**	-0.11	0.04	0.22*	0.19*	0.07	0.26*	-0.23*	0.29**	0.09	0.19*
Sex											
Male	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Female	0.78***	0.70***	0.31	0.44**	0.32+	1.45***	0.98***	0.84***	0.84***	0.57***	0.69***
Highest educational attainment											
Primary school	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Lower secondary	-0.31***	-0.28	-0.28	-0.46		-0.84***	-0.25	-0.19	-0.29	-0.53***	-0.11
Upper secondary	-0.44***	-0.59	-0.95**	-1.09+	-0.12	-1.19**	0.05	-0.25	-0.56*	-0.56**	0.12
Tertiary	-0.54***	-0.57	-0.76*	-1.34*	-0.21	-1.01**	-0.36	-0.65+	-0.04	-0.70**	-0.12
Constant	3.24+	-8.38+	4.53	11.50*	10.27*	1.90	14.60*	-16.39**	13.01*	5.98	9.22*
R ²	0.14	0.12	0.09	0.11	0.05	0.15	0.10	0.14	0.10	0.11	0.07
N	8,827	987	348	1,154	611	1,099	663	793	1,124	983	1,065

Legend: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001

Source: SHARE, family respondents aged 60 and older who are neither employed nor unemployed

Table A5 Different measures for depression

	Basic Model (Model 7)	Without symptom “depressed”	Without symptom “interest”	Without somatic symptoms	Only symptom “depressed”
Country					
Austria (AT)	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Switzerland (CH)	-0.16	-0.28*	-0.13	-0.08	0.12***
Germany (DE)	0.30**	0.18*	0.28**	0.20**	0.12***
Denmark (DK)	-0.28*	-0.28**	-0.28**	-0.23**	0.00
Spain (ES)	1.16***	1.00***	1.04***	0.83***	0.16***
France (FR)	0.70***	0.54***	0.68***	0.56***	0.16***
Greece (GR)	0.21+	0.16	0.16	0.27**	0.05*
Italy (IT)	0.83***	0.68***	0.76***	0.73***	0.15***
Netherlands (NL)	0.09	0.02	0.07	0.14+	0.07**
Sweden (SE)	-0.05	-0.10	-0.07	-0.10	0.05*
Contact with child(ren)					
Childless	0.12	0.13	0.10	0.16*	-0.01
Children in household or house	0.14*	0.14*	0.13+	0.11*	0.00
Daily contact	0.09	0.08	0.08	0.04	0.01
Several times a week or weekly	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Less than weekly	0.20+	0.17+	0.19+	0.16+	0.03

Table continued on next page

Tabel A5 continued

	Basic Model (Model 7)	Without symptom “depressed”	Without symptom “interest”	Without somatic symptoms	Only symptom “depressed”
Family status					
Living with spouse or partner ^a	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Never married, no partner	0.24*	0.21*	0.20+	0.13	0.03
Divorced, no partner	0.62***	0.54***	0.58***	0.41***	0.08***
Widowed, no partner	0.45***	0.34***	0.40***	0.33***	0.10***
Age effect					
Age	-0.10*	-0.11**	-0.09*	-0.09**	0.02*
Age*age/100	0.09**	0.10***	0.08**	0.08**	-0.01*
Sex					
Male	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Female	0.78***	0.61***	0.76***	0.53***	0.17***
Highest educational attainment					
Primary school	0 ^a	0 ^a	0 ^a	0 ^a	0 ^a
Lower secondary	-0.31***	-0.31***	-0.29***	-0.21***	0.00
Upper secondary	-0.44***	-0.44***	-0.42***	-0.32***	-0.00
Tertiary	-0.54***	-0.53***	-0.51***	-0.42***	-0.01
Constant	3.24+	3.98**	3.15+	3.30*	-0.81*
R ²	0.14	0.14	0.14	0.13	0.07
N	8,827	8,827	8,827	8,827	8,901

Legend: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001

Remark: For the model “Without somatic symptoms”, the symptoms “appetite”, “sleeping problems” and “fatigue” were left out when measuring depression

Source: SHARE, family respondents aged 60 and older who are neither employed nor unemployed